Leptospirosis

1. DISEASE REPORTING

A. Purpose of Reporting and Surveillance

1. To better understand the epidemiology of leptospirosis in Washington State.
2. To identify sources of infection (e.g., animals or contaminated water) and educate people about how to reduce their risk of infection.

B. Legal Reporting Requirements

1. Health care providers: notifiable to local health jurisdiction within 3 work days.
2. Hospitals: notifiable to local health jurisdiction within 3 work days.
3. Laboratories: no requirements for reporting.
4. Local health jurisdictions: notifiable to the Washington State Department of Health (DOH) Communicable Disease Epidemiology Section (CDES) within 7 days of case investigation completion or summary information required within 21 days.
5. Veterinarians: notifiable to Washington State Department of Agriculture or to the local health jurisdiction.

C. Local Health Jurisdiction Investigation Responsibilities

1. Facilitate the transport of specimens to PHL for confirmatory testing when necessary.
2. Report all *confirmed* and *probable* cases to CDES (see definition below). Complete the leptospirosis report form (http://www.doh.wa.gov/notify/forms/lepto.pdf) and enter the data into the Public Health Issues Management System (PHIMS).

   Note: Leptospirosis in an animal should be reported to the DOH Zoonotic Disease Program (360-236-3385).

2. THE DISEASE AND ITS EPIDEMIOLOGY

Background

Leptospirosis occurs worldwide but is most common in temperate or tropical climates. It is an occupational hazard for many people who work outdoors or with animals, for example, farmers, sewer workers, veterinarians, dairy farmers, or military personnel. It is a recreational hazard for those who participate in outdoor sports in contaminated areas and has been associated with swimming, wading, and whitewater rafting in contaminated lakes and rivers.

A. Etiologic Agent

The infection is caused by bacteria (spirochete) of the genus *Leptospira*. Multiple pathogenic species exist, including *Leptospira interrogans*, and are subdivided into serovars. More than 200 serovars have been identified within these species. Common pathogenic serovars in the United States included in the *L. interrogans* species are *pomona*, *icterohaemorrhagiae, canicola,* and *autumnalis*.

B. Description of Illness

Clinical presentation can range from a self-limited febrile illness to a severe illness associated with renal failure, liver failure, meningitis or pneunomitis. Infections can also be asymptomatic. Symptoms of leptospirosis include fever of sudden onset, headache, and chills. Severe muscle aches (calves and lumbar region) and conjunctival suffusion are specific clinical findings but are seen less commonly. Severe manifestations include aseptic meningitis, pulmonary hemorrhage, and impaired hepatic and renal function. Clinical illness lasts a few days to 3 weeks or longer. The illness generally has two phases: the acute or leptospiremic phase, followed by the convalescent or immune-mediated phase. If untreated, recovery may take several months.

C. Leptospirosis in Washington State

DOH receives 0 to 5 reports of leptospirosis per year. Some of the cases are related to recreational water exposure in other countries, but there have been cases exposed in Washington. In Washington, reservoirs include both wild and domestic animals.

Leptospirosis has also been diagnosed in dogs in Washington. No human illness has been linked to the reported animal infections in Washington.

D. Reservoirs

Many different kinds of animals carry the bacterium; they may become sick but sometimes have no symptoms. Leptospira organisms are shed in urine of infected animals including cattle, pigs, horses, dogs, rodents, and many wild animals. In carrier animals with chronic renal infections, leptospiruria persists for long periods or for life.

E. Modes of Transmission

Leptospirosis is transmitted by exposure to urine or tissues from infected animals. Although persons can acquire the disease by directly handling infected animals, the disease is more commonly acquired by contact with water or soil contaminated with the urine of infected animals during recreational (e.g., swimming, wading, camping, rafting) or occupational activities. Infection can occur by swallowing contaminated water or food, or through contact with broken skin or mucosal surfaces, such as the eyes or nose. Person-to-person transmission is rare.

F. Incubation Period

The incubation period ranges from 2–30 days.

G. Period of Communicability

Direct transmission from person to person is rare. Leptospires may be excreted in the urine, usually for 1 month, but leptospiruria has been observed in humans for months after the acute illness.

H. Treatment

Leptospirosis should be treated with appropriate antibiotic therapy.

Note: Jarisch-Herxheimer reactions may occur with antibiotic treatment.

3. CASE DEFINITIONS

A. Clinical Criteria for Diagnosis

An illness characterized by fever, headache, chills, myalgia, conjunctival suffusion, and less frequently by meningitis, rash, jaundice, or renal insufficiency. Symptoms may be biphasic.

B. Laboratory Criteria for Diagnosis

1. Isolation of *Leptospira* from a clinical specimen, or
2. Fourfold or greater increase in *Leptospira* agglutination titer between acute- and convalescent-phase serum specimens obtained ≥ 2 weeks apart and studied at the same laboratory, or
3. Demonstration of *Leptospira* in a clinical specimen by immunofluorescence.

C. Case Definition (1997)

Probable: a clinically compatible case with supportive serologic findings (i.e., a *Leptospira* agglutination titer of ≥ 200 in one or more serum specimens).

Confirmed: a clinically compatible case that is laboratory confirmed.

4. DIAGNOSIS AND LABORATORY SERVICES

A. Diagnosis

1. Serologic tests: The diagnosis of leptospirosis is most commonly confirmed by serologic tests. Antibodies develop during the second week of illness. An acute serum specimen should be collected when the diagnosis is suspected (during the acute phase of illness) and the convalescent serum specimen should be collected at least two weeks after the acute specimen.
2. Culture: Leptospires can be isolated from blood (first 7–10 days) or cerebrospinal fluid (CSF) (days 7–10) during the acute illness, and from urine after the 7th day, by using special media.
3. Immunofluorescence (IF) and ELISA techniques are used for detection of leptospires in clinical and autopsy specimens.

B. Services Available at the Washington State Public Health Laboratories (PHL)

Serologic testing and culture for leptospirosis is not performed at PHL but specimens will be forwarded by PHL to the CDC for testing. Contact Communicable Disease Epidemiology Section to arrange for testing.

C. Specimen Collection

Please enclose a completed PHL Serology form (available at: http://www.doh.wa.gov/EHSPHL/PHL/Forms/Serology.pdf) with serum specimens.

5. ROUTINE CASE INVESTIGATION

Interview the case and others who might provide pertinent information.

A. Evaluate the Diagnosis

Review the clinical presentation and laboratory results. Because leptospirosis rarely occurs in Washington, we prefer to confirm the diagnosis at CDC. If possible, arrange for diagnostic specimens (e.g., acute and convalescent sera) to be shipped to DOH Public Health Laboratories. Ensure that appropriate specimens are collected at the appropriate times (see Section 4A above).

B. Identify Potential Sources of Infection

Ask the case about contact with potentially infected animals and contaminated water (e.g., recreational water exposures, drinking untreated water, etc.). Report farm-associated or animal-associated cases to the DOH Zoonotic Disease Program (360-236-3385).

C. Identify Potentially Exposed Persons

Identify persons potentially exposed to the same source as the patient and educate them about symptoms of the disease to facilitate prompt diagnosis and treatment.

D. Environmental Evaluation

Report recreational water associated cases to the local environmental health division.

6. CONTROLLING FURTHER SPREAD

A. Infection Control Recommendations

Hospitalized patients should be cared for using standard precautions.

B. Case Management: No follow up needed

C. Contact Management:

None since the infection is not routinely spread person-to-person.

D. Management of Other Exposed Persons

Persons exposed to the same source as the case should be educated about symptoms of leptospirosis to facilitate early diagnosis. Doxycycline may be effective in preventing leptospirosis in adults exposed in high-risk areas. In Washington, prophylaxis would rarely be warranted.

Sehgal SC, Sugunan AP, Murhekar MV, Sharma S, Vijayachari P. Randomized controlled trial of doxycycline prophylaxis against leptospirosis in an endemic area. International Journal of antimicrobial agents. 2000;13(4):249–255.

E. Environmental Measures

If a site of exposure is determined, (e.g., contaminated lake) consider posting signs in the area to warn others of the risk and prevent further illness.

7. MANAGING SPECIAL SITUATIONS

A. Leptospirosis in an Animal

Consult with the DOH Zoonotic Disease Program (360-236-3385) regarding management of an infected animal.

B. Outbreaks

Determine if the case is associated with or potentially associated with an outbreak.

If an outbreak is suspected, notify CDES immediately: 1-877-539-4344.

8. ROUTINE PREVENTION

A. Immunization Recommendations

No licensed vaccine exists in the United States.

B. Prevention Recommendations:

Prevention involves avoiding contact with potentially infected animals and contaminated water and soil.

1. Persons should not swim or wade in water that might be contaminated with animal urine.
2. Persons with occupational or recreational exposure to potentially infected animals, water or soil should wear protective clothing, boots, and gloves.
3. Persons should not feed wildlife or attract wildlife to their backyards to prevent transmission to pets and people.
4. Persons should rodent-proof their homes.
5. Get your pet vaccinated against leptospirosis. The vaccine for pets does not provide 100% protection. This is because there are many strains (types) of leptospires, and the vaccine does not provide immunity against all strains. It is important to get your pet vaccinated again even if it gets leptospirosis because it can still get infected with a different strain of leptospires.
6. Dispose of animal carcasses properly.
7. Persons should drain potentially contaminated waters and soil when possible.

For additional information regarding leptospirosis, see:

http://www.who.int/csr/don/en/WHO_CDS_CSR_EPH_2002.23.pdf

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UPDATES

May 2008: Severe symptoms were added to section 2B

July 2008: Sections 1C and 7A were updated to include information regarding the reporting and management of leptospirosis in animals.